

to D. Hoag

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BLOOD LEVELS OF RF/F IN SELECTED EMPLOYEES:

Beginning in 1976 we began to sample selected 3M employees to determine the amount of organic fluorine (R-F) and inorganic fluoride (F) in their blood. Our subjects had varying degrees of exposure and/or contact with fluorochemicals. Because of the technical difficulties and the length of time needed to perform the tests, we were limited in the number of subjects tested. Each subject was interviewed in an attempt to determine what possible contact with fluorine or fluoride they may have had in addition to their work exposure. Items such as household products, water supply, dentifrices, drugs, etc., were considered. Subjects included (1) long and short time fluorochemical production and supervisory workers, (2) laboratory workers, including those with exposures over 20 years ago, (3) technical service employees who worked with fluorochemical products, (4) users of fluorochemical containing skin lotions, (5) office workers in close proximity to fluorochemical production facilities and (6) controls.

With only two exceptions, inorganic fluoride levels were found to be within the "normal literature levels". One of the exceptions had had a recent HF burn. In general, we found elevated R-F levels proportional to the length of time that had been spent by the employee in the production areas. We also found that laboratory workers, with former exposure, but none for 15-20 years, had elevations of RF (above literature 'normals') but of low magnitude.

Several employees had multiple samples tested over a 1 1/2-2 year period, and in general the values stayed in the same range. There was one exception. That person had a significant rise which we felt could be explained by a combination of increased production levels and failure to wear prescribed personal protective devices. This person had the highest detectable level of RF (71 ppm), and it was confirmed by repeat testing. He has been removed from all fluorochemical contact and weekly determinations of blood R-F levels and 24-hour urine excretion of R-F will be done. It should be noted that one series of tests has determined that R-F is present in the urine.

Attempts have been made to identify the chemicals that make up the organic fluorine content. This subject will be covered by others at 3M who are involved in the analytical procedures.

The attached charts give the ranges of RF/F values that we found in our employees.

Encl. List of FC blood values to 2074

